

## **ABSTRACT OF THE DISCLOSURE**

A two-layered fenestrated vascular graft is provided for repair of diseased, damaged or aneurismal blood vessels. The fenestrated vascular graft is configured to be delivered  
5 transluminally and implanted within the lumen of a native blood vessel using catheter-based minimally-invasive surgical techniques. The vascular graft is fenestrated or perforated to facilitate making a fluid connection or anastomosis with one or more of the sidebranches of the vessel into which it is implanted. The vascular graft is adapted for implantation into blood  
10 vessels, such as the aorta, having tributary vessels or sidebranches along the section of the blood vessel to be repaired without occluding or obscuring the sidebranches. Methods are described for implanting the vascular graft into a patient's aorta for repairing thoracic or abdominal aortic aneurysms and for making a fluid connection or anastomosis with the tributary vessels or sidebranches of the aorta, such as the renal, hepatic and mesenteric arteries.